EUROPEAN PINE SHOOT MOTH.....1968

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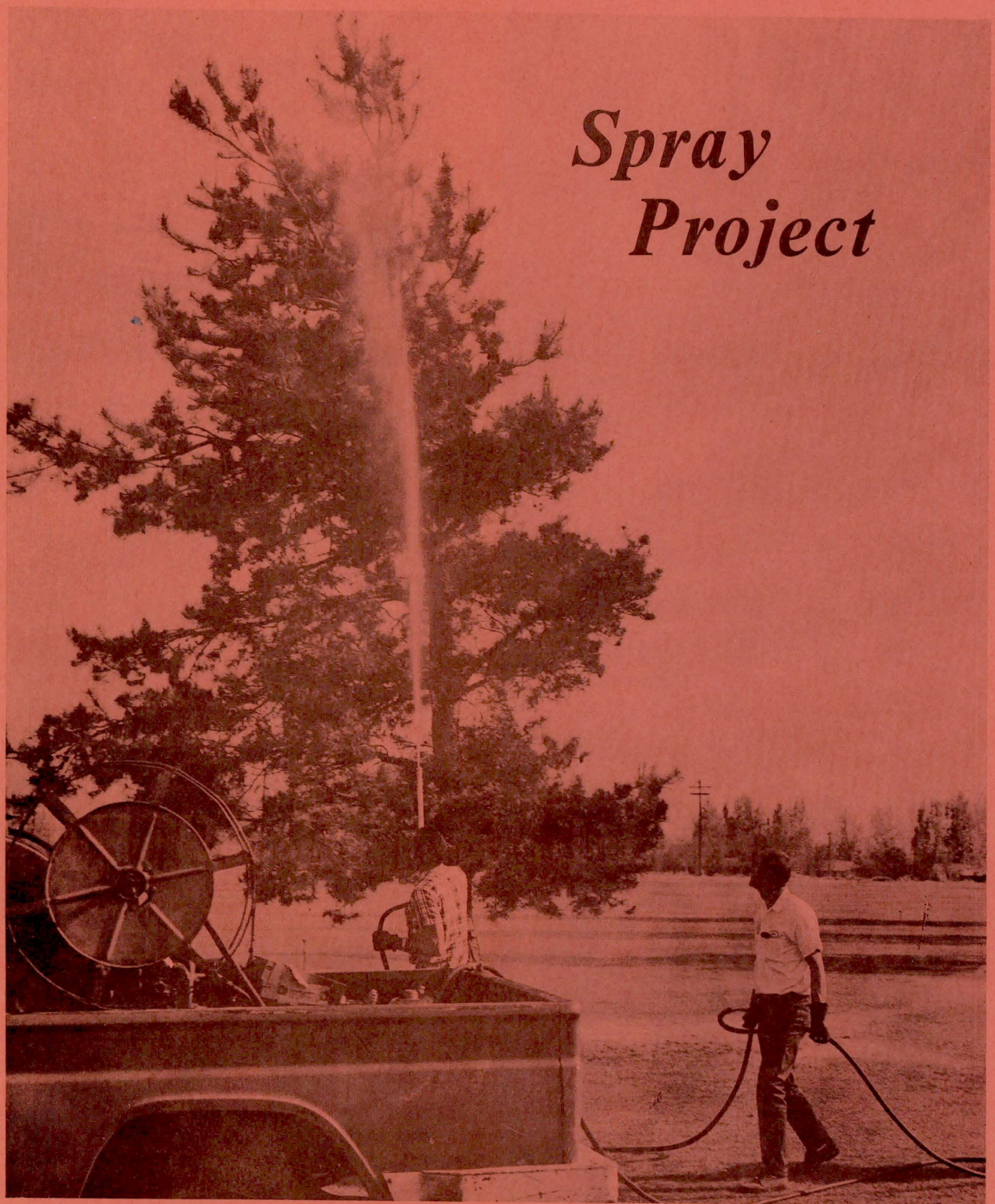

Oregon State Forestry Department

EUROPEAN PINE SHOOT MOTH

1968

SPRAY PROJECT REPORT

by
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Oregon Department of Forestry
Salem, Oregon

March 1968

J. E. SCHROEDER, State Forester

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INTRODUCTION

Prior to the summer of 1967, there were no known established infestations of the European pine shoot moth in the State of Oregon. Extensive surveys and spot eradication of small infestations, conducted cooperatively by the U. S. Forest Service, Oregon Departments of Agriculture and Forestry had apparently been successful.

The positive identification and confirmation of a larva as being Rhyacionia buoliana (Schiff.) taken from a pine tree in Hermiston in the fall of 1967, was the first report of this insect in eastern Oregon. Immediately after the discovery, survey crews started an intensive survey of the area and found additional infestations in Hermiston, Umatilla, McNary Manor and in landscape plantings at McNary Dam. Analysis of the stems indicated that the infestations had been in the area for six to twelve years.

Spot checking of surrounding communities revealed no additional infestations at that time.

BACKGROUND

A special meeting of the European Pine Shoot Moth Committee was held in Hermiston shortly after the discovery of the insect in that area.

The following points were affirmed at the meeting:

1. There were also infestations in Kennewick, Walla Walla and College Place, Washington.
2. There were pine plantations within 15 miles of the Walla Walla-College Place infestations.
3. The Kennewick, Washington and Hermiston, Oregon areas were fifty or more miles from native pine stands.

The following preliminary recommendations were made:

1. The infestations in Kennewick and the Hermiston area should be reduced, if possible, by application of sprays.
2. The McNary Dam plantings would be reserved for research.
3. Due to the close proximity of pine plantations to Walla Walla and the existence of commercial nurseries containing pine in the area, it was the consensus of the group that this infestation should be eliminated by destruction of infested pines.

At subsequent meetings of the Departments of Forestry and Agriculture with the U. S. Forest Service, the following operational concepts were established:

1. The Oregon Department of Agriculture would establish an administrative control area in Umatilla County. (Appendix, Exhibit A).
2. The Oregon Department of Forestry would supervise the spray project with technical assistance from the other agencies.
3. A cooperative agreement between Oregon State Department of Agriculture, Oregon State Forestry Department, Oregon State University and United States Forest Service was written and signed by the respective agencies. (Appendix, Exhibit C)
4. A financial plan for the project, under the existing Cooperative Agreement between the State Forestry Department and the U. S. Forest Service was approved with the U. S. Forest Service paying fifty percent of the cost and the State paying fifty percent of the cost.

Recognizing the lack of detailed information on adequacy of sprays for controlling the shoot moth, a meeting was called to review available data and make recommendations for the project. (Appendix, Exhibit D)

Shortly after this, a meeting was arranged in Hermiston with the cooperation of the County Agent. The European pine shoot moth problem and the proposed spray project were explained to the citizens. The overall reception by the people was excellent and the project procedures accepted.

PREPARATION

Pre-spray survey

During April 1968, a pre-spray survey was conducted to determine more precisely the perimeter of the infestation and to locate new pine plantings within the infested area. Eleven man days were spent on the survey. Three additional infested trees in Hermiston and two in Umatilla were found.

Pre-spray sampling

Of the 1,304 known pine trees in the communities of Hermiston, McNary Manor and Umatilla, only 312 contained easily recognizable infestations. The population on these trees varied from a couple of attacks to many per tree. There was also extreme variation in tree species and size.

It was originally planned to leave some trees as controls. However, due to the shortage of adequate sample trees, this was not done.

Seventeen trees at Hermiston and eleven at McNary Manor having the heaviest infestation were selected for sampling. Larval populations on the remaining trees suffered mortality over the winter.

Sampling was conducted four different ways due to the extreme variation in larval population, tree size and growth form. In each the objective was to sample maximum number of shoot moth attacks. The four different sample systems were:

1. Small trees, 1 to 1.5 feet in height and multistem; entirely Mugho pines - every bud examined.

2. Medium trees, 1.5 to 6 feet in height and multistem; mostly Mugho pine but some Japanese red pine - one to two upright branches per quadrant were sampled.
3. Large trees, 6 to 15 feet in height with one main stem and lateral branches; lodgepole, Scotch, Austrian, Jeffrey and ponderosa pines - one to two lateral branches per quadrant were sampled.
4. Same as number three except very light, scattered populations. Every infested bud that could be located throughout the crown was sampled.

The form used to record information from each sample tree is included in the Appendix, Exhibit E.

Spring attacks on some trees were marked with map tacks or ribbons to aid in observing larval migration. Several new "tents" per sample were examined to determine the percentage which were empty or contained dead larvae. New shoots were measured on several branch samples in an attempt to obtain a possible correlation between host and insect development.

Home owner contacting

Preceding the project, news releases were issued and talks given to inform the public of the project.

The public was again notified by the local radio and newspaper one day before spraying. A two man team also made individual contacts with home owners who had pine trees on their property. The contact team informed the owner about the project, type of chemicals used, when to expect their trees to be sprayed, and answered questions which arose.

A brochure with the above information was left at the residence when the home owner was not at home. Six man days were spent on this contacting.

Contracting

The written agreement was developed by the Oregon State Forestry Department with the assistance of specialists from several fields. State and Federal regulations and safety requirements applicable to the control project were incorporated into the contract.

The contract was awarded to the Pendleton Grain Growers, Inc., of Hermiston, Oregon. The bid price was $2.20 per tree. Major features of the contract were:

1. Estimated number of trees to be sprayed.
2. Insecticide formulation for Hermiston, Umatilla and part of McNary Manor was four pounds of 50% wettable powder of Sevin (carbaryl) per 100 gallons of water. One pound of 35% wettable powder of Kelthane was added to the Sevin mixture. Several trees at McNary Manor were sprayed with Cygon 267 (dimethoate) at the rate of 3 pints per 100 gallons of water.
3. Chemicals were to be applied to the trees until the mixture began to drip from the foliage.
4. Spray operations were to be confined to periods when wind velocities were less than approximately 10 miles per hour for trees 10 feet in height when wind velocity reached approximately 5 miles per hour.
5. The contractor was required to provide with each spray unit a qualified, licensed spray operator and an assistant.
6. The operator would be responsible to protect houses, cars, plants, etc., from the spray.
7. The contractor would furnish two hydraulic spray units capable of producing 10 gallons per minute and 400 pounds per square inch of pressure. In addition a hydraulic lift would be needed to spray trees over 30 feet in height.

8. The contractor was required to furnish and mix all chemicals for the project.

OPERATION

Timing

Examination of the shoot moth population on April 2 indicated that approximately fifty percent of the population in Hermiston had left the bud in which they had over-wintered, and were either crawling on the outside of the branches or had entered another bud. The spring attacks were well marked by "tents".(1) Development at McNary Manor was slightly behind that in the city of Hermiston. The spring migration of the larva was several weeks ahead of what was anticipated.

It was felt that this period would have been the most desirable time to apply the insecticides. However, the Oregon Department of Agriculture Administrative Order AD872 was not to become effective until April 15, 1968. Because of this legal date and work load of local pest control operators, it was decided not to start spraying before April 15.

Spraying commenced on April 17, 1968 and continued during periods of low wind velocities on April 18, 19 and 22.

Administration of Spray Operations

The town of Hermiston was divided into four sections by quadrants (NE, NW, SE and SW) for administrative control and record keeping.

The Forestry Department furnished one man with each of the spray units to observe the spray operator, locate properties with pines to be sprayed, and general record keeping.

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(1) Webbing constructed by the larva at the entrance hole. Later frass and resin forms on the webbing and becomes hardened into a pitch mass.

One 200 gallon pickup mounted slip-on unit and one 260 gallon trailer mounted unit pulled behind a pickup were used and furnished by the contractor. Both equipment and personnel complied to the contract specifications. A hydraulic lift was used to spray the trees over 30 feet in height.

A statistical summary is presented in the Appendix, Exhibit F.

Entomological observation

Muslin cloths were placed under several trees shortly before spraying to observe initial "knock-down" of larvae. The cloths were picked up 24 hours after spraying. Behavior of the shoot moth as well as other insects on the trees was observed.

Post-spray sampling

Sampling to estimate mortality was conducted 7 and 21 days after the initial spraying. All buds and juvenile cones on the pre-spray sample branches were examined. The number of dead and live insects were recorded on the same form as used in pre-spray sampling. (Appendix, Exhibit E)

Pre-spray subsamples indicated that 17 percent of the attacked buds did not contain larvae. Post-spray samples taken at 7 and 21 days, indicated that 41 and 47 percent of the buds respectively were empty. This presented a serious problem in analyzing the data and determining the reasons for the zero observations. The question was raised as to whether the empty buds were the result of natural behavior or the influence of the insecticides. There was not a significant number of larvae on the drop cloths from the initial knockdown to help explain the fate of larvae from the empty buds.

It would be expected that the number of buds that had been mined and then abandoned would increase up to the pupal stage. However, since this figure was not known, the decision was made to assume that the same

percentage of larvae would continue to migrate after the chemicals had been applied as before spraying. The pre-spray figure was used to adjust the number of empty buds to natural migration and the remainder to the insecticides.

Adult trapping

In order to obtain more biological data on the moth in Hermiston, pupae collected during final sampling were sexed and held in vials until the adults emerged. A total of 109 pupae were collected of which 86 were females and 23 were males. Three pupae were parasitized. Three unmated females were placed in each quart-size cylindrical trap, designed after traps used by other entomologists in the Pacific Northwest.

Five trees were selected from the best sample trees, and one trap was placed on each tree.

The traps were in operation from May 14 to June 14. Weekly observations were made and female moths were replaced at that time.

RESULTS

Spray operations

Good cooperation was noted throughout the project between governmental agencies, the contractor and the public.

Total expenditures for the entire project were $5,637.79 or $4.32 per tree. Detailed summaries of costs are shown in the Appendix, Exhibits F and G.

Initial Insect Knock Down

The number of shoot moth larvae found on cloths placed under the trees varied from zero to nine. The greatest percentage occurred within a couple of hours after spraying. Only about a third of the larvae under trees treated with Sevin and Kelthane were dead and the remainder were alive.

The live larvae were collected along with a small piece of drop cloth which was completely saturated with chemicals. A piece of the cloth and a larva was placed in separate petri dishes and held for five days. All larvae lived for at least three days and one even pupated.

Cloths under trees sprayed with Cygon had the largest number of dead shoot moth larvae. However, several complete buds containing live pupae were found on the cloth indicating that some knock down was due to the physical force of the chemical spray and not fumigation action.

A few Diptera and Hymnoptera (Ichneumomdae) adults were found on all of the cloths.

Insect Mortality

Percent reduction figures in insect numbers were obtained from pre-spray and three-week, post-spray data corrected to allow for some natural migration as discussed under the Operation Section.

The insect population on trees sprayed with Sevin and Kelthane in Hermiston was reduced approximately 70 percent, while the population on trees sprayed with Cygon at McNary Manor was reduced approximately 86 percent.

It must be realized that many factors were involved in reducing the population beside the insecticides applied during the project.

Some of the factors during the control project were:

1. Application of insecticides by home owners and pest control operators during the post-spray sampling period.
2. Collecting of insects by many individuals.

Other factors before and after the project were:

1. Natural mortality during the winter, particularly at McNary Manor.
2. At least three good sample trees were known to be destroyed by home owners.

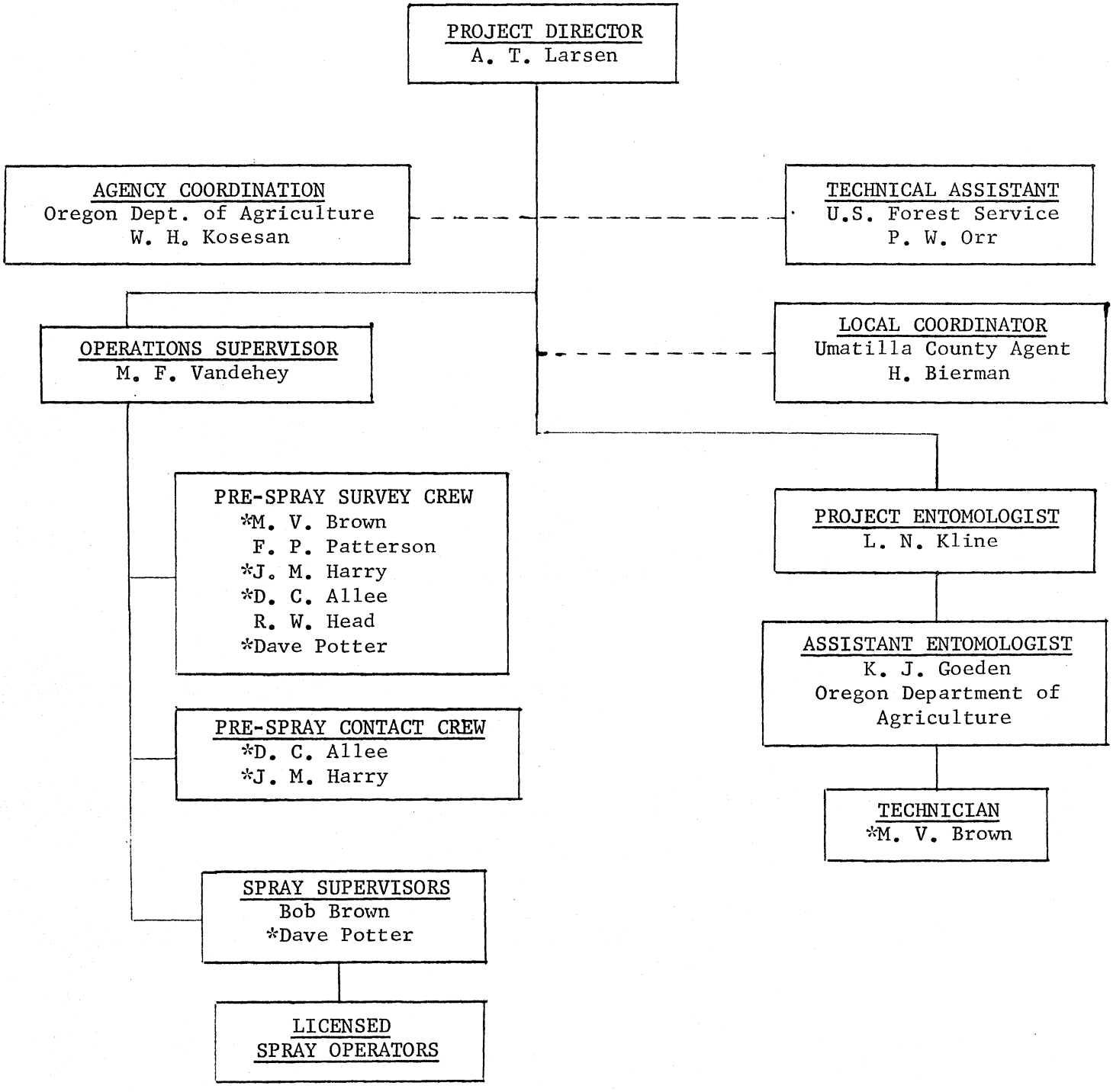
Adult traps

Several traps attracted adults the first evening that they were installed. The number of adults caught in the traps varied from four to fourteen. Peak emergence appeared to be during the period of May 20 through May 31.

EXHIBIT "H"

ORGANIZATION CHART

1968 EUROPEAN PINE SHOOT MOTH - EASTERN OREGON CONTROL PROJECT



*Used the same men on more than one interrelated jobs.

EXHIBIT "A"

STATE OF OREGON
DEPARTMENT OF AGRICULTURE
Plant Division
Agriculture Building
Salem, Oregon

ADMINISTRATIVE ORDER NO. AD 4-68

RELATING TO FORMATION OF A PINE SHOOT MOTH CONTROL AREA IN UMATILLA COUNTY, OREGON.

Pursuant to authority vested in the State Department of Agriculture, Salem, Oregon, by ORS chapters 561, 570 and 571, and particularly ORS 570.405 to 570.415, the following order, control order and regulations relating to the establishment of a control area in Umatilla County, State of Oregon, for the control of European pine shoot moth, Rhyacionia buoliana (Schiff.), are hereby promulgated:

Section 1. DEFINITIONS.

As used in sections 1 to 8:

(1) "Cooperating" and/or "consulting and advising" agencies means the United States Forest Service, Oregon State University and the Oregon State Forestry Department.

(2) "Department" means the State Department of Agriculture, Salem, Oregon.

(3) "Insect pest" means European pine shoot moth, Rhyacionia buoliana (Schiff.).

(4) "Host plants" or "host trees" means and includes all Pinus species.

(5) "Insecticide" means any chemical formula or treatment used or recommended by the department, or used by a cooperating agency with the approval of the department, for the control of European pine shoot moth.

Section 2. INTENT AND PURPOSE.

European pine shoot moth has been verified to exist in certain areas of Umatilla County, Oregon. Unless immediate procedures can be determined and perfected which will be effective in controlling European pine shoot moth, other than entire destruction of the trees in which it exists, it is possible that the nursery business in Oregon with sales of pine trees and shrubs totaling approximately $2,500,000 annually can be substantially and seriously affected. The insect also presents a potential threat to the pine lumber industry which annually represents $115,000,000 to Oregon's economy. It is the intent and purpose, therefore, of this control order to attempt control of European pine shoot moth within the presently-known infested areas and to prevent its spread to noninfested areas of this state including but not limited to residential property and natural timber stands.

Section 3. BOUNDARIES OF CONTROL AREA.

A control area is hereby established and created in Umatilla County, Oregon, to carry out and enforce the provisions of sections 1 to 8 of this order, within the boundaries described as follows:

Beginning at a point where the western boundary of Section 7 of Township 5 North, Range 30 E.W.M. intersects the southern bank of the Columbia River; thence south along the western boundaries of sections 18, 19, 30 and 31 of Township 5 North, Range 30 E.W.M.; thence in a southerly direction along the western boundaries of Township 4 North, Range 30 E.W.M. and Township 3 North, Range 30 E.W.M. to the southwest corner of section 31 of Township 3 North, Range 30 E.W.M.; thence west to the southwest corner of section 31 of Township 3 North, Range 28 E.W.M.; thence south to the southwest corner of section 31 of Township 2 North, Range 28 E.W.M.; thence west to the western boundary of Umatilla County, Oregon; thence north along the western boundary of Umatilla County, Oregon to the southern bank of the Columbia River; thence in an easterly direction along the southern bank of the Columbia River to the point of beginning.

(FOR INFORMATIONAL PURPOSES ONLY: The control area roughly covers an area about 15 by 16 miles in the northwestern corner of Umatilla County. Includes for example Hermiston, Stanfield, Echo, McNary Dam, etc.)

Section 4. DESIGNATION OF RESEARCH AND CHEMICAL TREATMENT AREAS.

(1) (a) Research: A research area is also hereby designated by the department as a part of and located within the control area. This research area consists or covers all the host trees located within the McNary Dam landscaped area. Such trees will be used for research on attractants, sterile males, or any other studies which may be undertaken by the cooperating agencies or the department. The department may designate or use other areas within the control area as research areas, as it deems necessary and after consultation with the cooperating agencies.

(b) No person shall fail or refuse to comply with the requests of authorized employes of the department or the cooperating agencies in carrying out the research procedures and studies.

(2) (a) Chemical Treatment: Chemical treatment areas are hereby designated by the department as a part of the control area: The City of Hermiston, Oregon, and the host trees located adjacent thereto, the City of Umatilla, and all of the area within the McNary Manor. These areas are designated for the purpose of setting out the host trees therein and on which spraying of chemicals shall be made to determine their effectiveness as a means of controlling European pine shoot moth. The chemical recommendations, application, and evaluation of results will be done after approval of and by the department and by the cooperating agencies. The department may designate or use other areas within the control area for the purposes set forth in this paragraph, as it deems necessary.

(b) No person shall fail or refuse to comply with the requests or demands of authorized employes of the department and the cooperating agencies in carrying out or enforcing the provisions of this section. No person shall fail or refuse to allow the employes of such agencies to go upon property on which host trees are located and to use or spray the chemicals as are deemed necessary under the provisions of this section.

Section 5. ERADICATING OR CONTROLLING EUROPEAN PINE SHOOT MOTH.

If, as a result of the research, experimentation and other work carried on by the department in conjunction with, and in cooperation with the cooperating agencies, it is mutually reasonably determined that certain pesticides when used or applied to nursery stock or host trees will eradicate or control European pine shoot moth, then the department may require that owners or persons in possession or control of nursery stock or host trees shall apply, spray or use certain pesticides to such nursery stock or host trees, in the manner and at such times as the department deems necessary.

Section 6. CONDITIONS GOVERNING MOVEMENT OF HOST TREES FROM CONTROL AREA.

(1) Host trees shall not be transported or moved out of the control area, unless each lot or shipment has been fumigated with Methyl Bromide in accordance with the schedule and in the manner shown below in this section, and each such lot or shipment is accompanied by a certificate issued by the department (or a person authorized by the department) certifying the fumigation was done and listing the treatment used, plus the time and chamber temperature.

Approved treatment is fumigation with Methyl Bromide at the dosage and schedule outlined in the Pacific Northwest Forest and Range Experiment Station Research Paper No. 47 dated March 1962, entitled "Eradicating European Pine Shoot Moth on Ornamental Pines with Methyl Bromide" by V. M. Carolin, W. H. Klein, and R. M. Thompson. Examples are:

Methyl Bromide gas concentration: 4 lbs./1000 cu. ft.

Chamber Temperature Treatment period:

46	3 hrs. 24 min.
50	3 hrs. 8 min.
55	2 hrs. 52 min.
60	2 hrs. 38 min.
62	2 hrs. 31 min.

Methyl Bromide gas concentrations must be maintained at four pounds per 1000 cubic feet during the entire treatment period.

(2) This section shall not apply to cut pine trees, branches, or twigs for ornamental purposes, shipped during the period October 20 to December 31 of each year.

Section 7. ADDITIONAL AUTHORITY

Nothing in sections 1 through 6 shall be construed as prohibiting or preventing the department from taking any other procedure or action deemed necessary to carry out the intent and purpose of this order as set forth in but not limited to the provisions of section 2 above. Particular emphasis is placed on ORS 570.170 to 570.190.

Section 8. No person shall violate the provisions of sections 1 to 7 of this order.

This order shall be effective April 15, 1968, as postponement would and

could result in serious prejudice to the public interest and particularly to the nursery and pine industries of this state, as well as its economic welfare. Immediate additional and further planning is necessary by the cooperating agencies in order to carry out the intent and purpose of the order. And adequate advance time in which to further contact and cooperate with the persons who will be affected thereby.

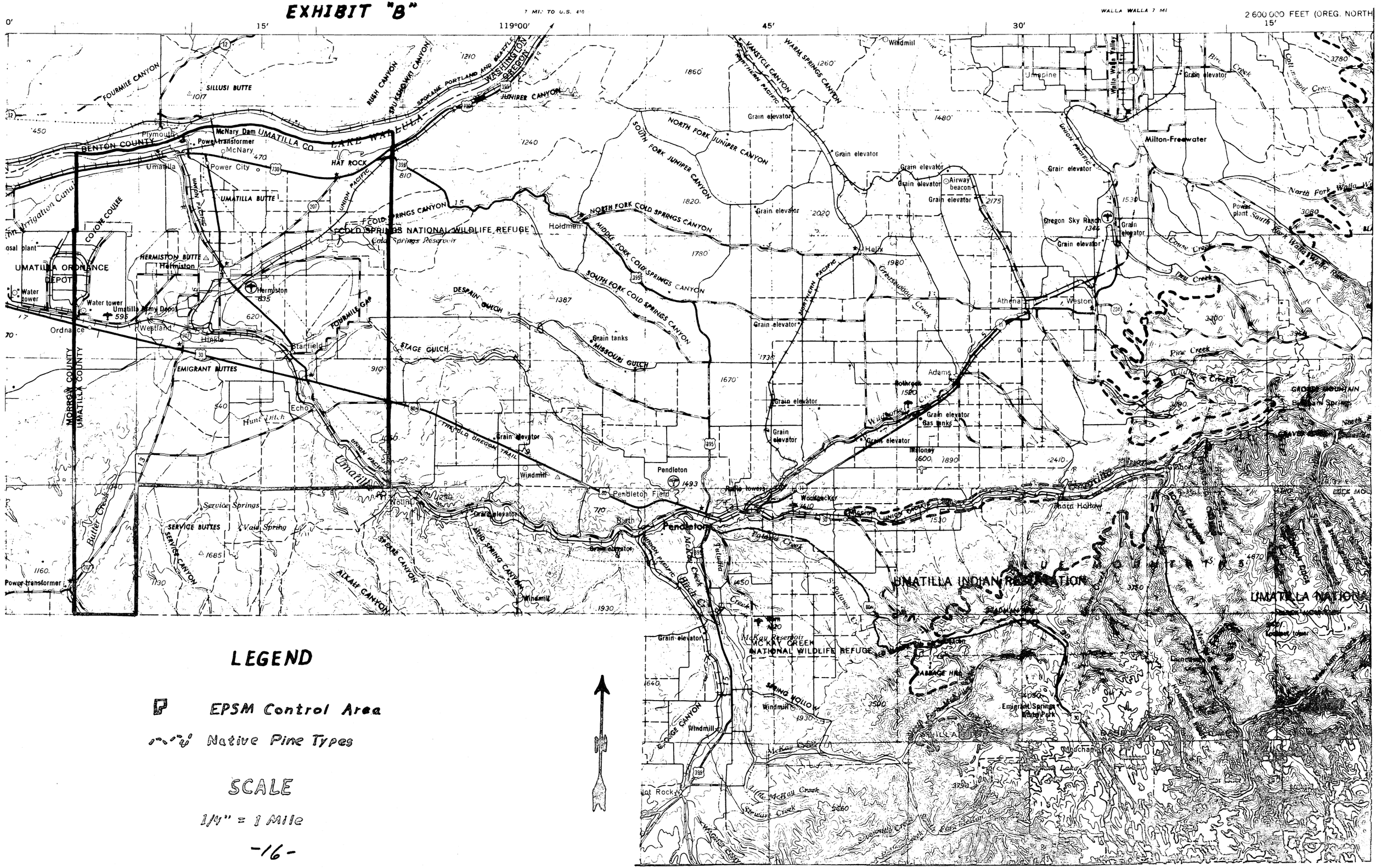
Dated this 26th day of March, 1968.

S/Walter Leth
Walter Leth, Director

S/W. H. Kosesan
W. H. Kosesan, Hearing Officer

S/Tom McCall
Governor of Oregon

EXHIBIT "B"



LEGEND

EPSM Control Area

Native Pine Types

SCALE

1/4" = 1 Mile

EXHIBIT "C"

COOPERATIVE AGREEMENT
between
Oregon State Department of Agriculture
Oregon State Forestry Department
Oregon State University
United States Forest Service

WHEREAS, the European pine shoot moth has been verified to exist in certain areas of Umatilla County, Oregon, and immediate procedures are necessary to effectively control the infestation of the pine timber of Oregon; and

WHEREAS, the Governor of the State of Oregon has approved Administrative Order No. AD 4-68, promulgated and issued under ORS chapters 561, 570 and 571, with particular reference to ORS 570.405 to 570.415, for the establishment of a control area in Umatilla County, Oregon, for said infestation;

WHEREAS, the insect presents a present and potential threat to the pine lumber industry and emergency steps are needed to be taken by the State of Oregon through its cooperating agencies to attempt to control the infestation of the European pine shoot moth, as well as determination of ways and means to eradicate the moth.

NOW, THEREFORE, the parties hereto, Oregon State Department of Agriculture, hereinafter referred to as "DEPARTMENT," the Oregon State Forestry Department and Oregon State University, hereinafter referred to as "COOPERATORS," and the United States Forest Service, do hereby agree and cooperate as follows:

I

ORDER NO. AD 4-68

1.01 Order Issued and Approved: That Administrative Order No. AD 4-68, and any amendments or supplements thereto, marked Exhibit "A," attached hereto and by this reference made a part hereof, sets forth the emergency conditions, areas, and necessity for controlling and, if probable, eradicating the European pine shoot moth. Said order stating the boundaries of control area, and designation of research and chemical treatment areas generally within which COOPERATORS shall operate.

1.02 Amendments - Supplements: Should Administrative Order No. AD 4-68 be amplified or extended by order of DEPARTMENT and executive approval, it is agreed that such amendments or supplements shall be and become a part of said Exhibit "A."

1.03 Program - Project: It is understood and agreed that said Exhibit "A" reflects and shall set forth the control project and eradication program to be undertaken by the parties hereto.

II

SERVICES SUPPLIED

2.01 Services Supplied: By authority of the aforementioned statutes and ORS 561.240, DEPARTMENT delegates the responsibility of providing services for the project and program designated in Paragraph 1.03, hereof, to COOPERATORS. Under such delegation COOPERATORS agree to carry out and provide the services designated.

2.02 Cooperation: It is understood and agreed that DEPARTMENT, COOPERATORS and the United States Forest Service shall work and cooperate during the period of this agreement to achieve the intent and purposes of Administrative Order No. AD 4-68, as such are set forth in Section 2, thereof.

2.03 Authorized Representative: For purposes of this cooperative agreement, each party hereto shall designate an authorized representative, which designated person shall be authorized to act on behalf of his party to carry out the programs and projects revealed by said Exhibit "A."

2.04 Personnel and Equipment: Each party agrees to provide the necessary personnel and equipment required of it by said Exhibit "A," said personnel and equipment to remain under the control and direction of the party. Each party shall be only and solely responsible for the acts and omissions of its officials, employees, representatives and contractors.

III

GENERAL PROVISIONS

3.01 Sub-contracting: Any party obligated to provide services by said Exhibit "A" may provide such services itself, or provide such through contract or otherwise with written approval of the other parties. The party sub-contracting services shall be responsible therefor, including payment for the services rendered.

3.02 Limitations: It is understood and agreed that each party hereto shall in no event be obligated to any other party or parties beyond its statutory authority and appropriations.

3.03 Official Addresses: For purposes of this agreement, the official addresses of the parties are as follows, unless later changed by written notice:

DEPARTMENT:

Agriculture Building
635 Capitol Street, N.E.
Salem, Oregon 97310

OREGON STATE FORESTRY DEPARTMENT:

2600 State Street
Salem, Oregon 97310

OREGON STATE UNIVERSITY:

Entomology Department
Corvallis, Oregon

UNITED STATES FOREST SERVICE:

Multnomah Building
319 S. W. Pine Street
Portland, Oregon

3.04 Forest Service Participation: An existing cooperative agreement between the United States Forest Service and the State Forestry Department shall be the basis for federal participation in this agreement. In conjunction with said agreement, the delegated responsibility to the Oregon State Forestry Department shall be performed.

IV

DURATION - TERMINATION

4.01 Duration of Agreement: This agreement shall be effective until terminated or cancelled as provided in Paragraph 4.02.

4.02 Termination - Cancellation: Any party hereto may terminate this agreement by giving each of the other parties thirty (30) days' prior written notice. The parties may mutually cancel this agreement at any time.

IN WITNESS WHEREOF, the parties hereto have caused this cooperative agreement to be executed in quadruplicate on this 28 day of May, 1968.

OREGON STATE DEPARTMENT OF AGRICULTURE

Witness

s/Don Parker

By s/Walter Leth

OREGON STATE FORESTRY DEPARTMENT

Witness

By s/J. E. Schroeder

OREGON STATE UNIVERSITY

Witness:
4-25-68 s/Wilbur T. Cooney, Dean of Agric.
s/Carl H. Stoltenburg, Dean of Forestry

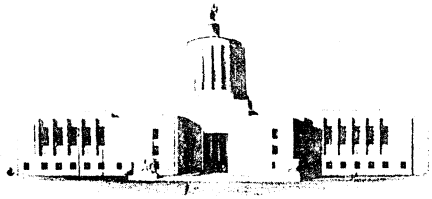
By s/Hugh F. Jeffrey
Business Manager

UNITED STATES FOREST SERVICE

Witness

By s/Charles Connaughton

EXHIBIT "D"



STATE OF OREGON
OFFICE OF STATE FORESTER
2600 STATE ST.

ADDRESS REPLY TO
"STATE FORESTER"

MAILING ADDRESS:
P. O. BOX 2289
SALEM, OREGON 97310

January 25, 1968

TO:

Herman Bierman	Pete Larsen
Val Carolin	Stan Meso
Bob Every	Mike Vandehey
Rick Johnsey	Ben Howard
Bill Kosesan	Dr. P. O. Ritcher
Al Larsen	Dr. J. T. Pennell

Gentlemen:

This is a summary of our technical meeting on January 23 concerning control of the European pine shoot moth in northeast Oregon.

Several insecticides were discussed. Insecticides considered highly toxic, ineffective for control, or unfavorable from public reaction were: Thimet, Guthion, malathion, BHC, chlordane, Zectran and DDT. The most desirable candidates because of effectiveness and safety were diazinon, Sevin and Cygon.

Sevin (carbaryl) was selected over diazinon and Cygon for use in Hermiston and possibly several trees near homes at McNary Manor, Inc. and Umatilla. This decision was based upon J. W. Butcher's work in Michigan in 1958 where 91% mortality was obtained by application at the time overwintered larvae began spring activity. Other reasons are that Sevin is safer and less expensive than Cygon. There are approximately 1,000 trees to be sprayed in Hermiston. One application of Sevin, 50% wettable power at the rate of 4 lbs. per 100 gallons of water will be applied against the larvae during the first part of May. (Timing is subject to further analysis and weather this spring.) Kelthane, 35% wettable powder was suggested to be added to Sevin at 1 lb. per 100 gallons to control a possible build-up of mites either on pines or adjacent plants.

Cygon 267 (dimethoate) at 2 lb. actual per 100 gallons of water (3 pints per 100 gal.) will be applied on approximately 80 isolated trees (not adjacent to homes) at the McNary Manor, Inc. as a larval spray. Timing would be about a week or two before Hermiston to allow time for the chemical to enter the plant tissue and of the convenience of administering the two areas.

A fluorescent dye tracer was suggested to aid in spray assessment.

Spray equipment was briefly discussed. A hydraulic sprayer with a capacity of 10 gallons per minute for high trees (60 ft.) at 400 p.s.i. was believed to be the best. Spraying would stop on trees over 10 feet when wind velocity reached 8 mph.

Timing of applications and evaluations were mentioned, but time did not allow detailed discussion. This matter will be considered in mid-February by a small group of entomologists. A field trip to analyze the problem on the ground will probably be needed.

Monitoring and surveillance were discussed in some detail. It was the opinion of the group that a formal organization was not needed to do this work. However, Dr. Ralph Sullivan and LaVerne Miller of the Oregon State Board of Health, Joe Capizzi of the Oregon Interagency Pesticide Council, and physicians in Hermiston will be contacted and kept informed of the project plans.

I would appreciate hearing from you immediately if you have any comments conderning this summary and plans. My phone number is 364-2171, Extension 1343.

Thank you for your assistance and cooperation thus far. We will keep you informed of developments.

LeRoy

LNK:nep

EXHIBIT "E"

EUROPEAN PINE SHOOT MOTH

POPULATION EVALUATION FORM

ADDRESS: _____

SPRAY BLOCK NO. _____ RECORDER _____

DATE _____ TREE NO. _____ SPECIES _____ SIZE _____

WEATHER: _____

Quad. No.											TOTAL
Branch No.	1	2	3	4	5	6	7	8	9	10	
No. Non-infested Buds											
No. Fall Attacks											
Occupied Buds											
Empty Buds											
No. Spring Attacks											
Occupied Buds											
Empty Buds											
No. Larvae											
Alive											
Dead											
No. Pupae											
Alive											
Dead											
TOTAL											

REMARKS: _____

EXHIBIT "F"

STATISTICAL SUMMARY

A. Trees sprayed:

1. Hermiston	1,217
2. McNary Manor	82
3. Umatilla	5
Total trees sprayed	1,304

B. Cost per tree:

1. Contract bid price, includes chemicals, equipment and personnel of contractor	$2.20
2. Total project cost per tree, includes bid price overhead, administration, etc.	4.32

C. Man days worked by State Forestry and Agriculture Personnel:

1. Pre-spray survey of Hermiston	11
2. Sampling before and after project	16
3. Pre-spray home owner contacting	7
4. Spray rig supervision	8
Total man days	42

D. Spray time:

1. Sprayed 1,304 trees in 21 hours.

2. Approximately 2 minutes per tree.

This time included repair, refilling tanks, travel time between trees; but does not include stand-by time.

E. Insecticide information:

1. Spray mixtures:

   a. Sevin (carbaryl), 50% wettable powder at the rate of 4 pounds per 100 gallons of water. Kelthane, 35% wettable powder at the rate of one pound per 100 gallons of water was added to the Sevin mixture.

b. Cygon 267 (dimethoate) at the rate of 3 pints per 100 gallons. X-77 spreader-sticker was added to the mixture at the rate of 4 ounces per 100 gallons.

2. Amount and cost of insecticide (Approximate figures obtained from contractor).

a. Total gallons of mixed chemicals:

Sevin and Kelthane	2,070
Cygon and X-77	462

b. Total actual chemicals used in mixture:

Sevin 50% wettable powder.	83 pounds
Kelthane 35% wettable powder	21 pounds
Cygon 267.	13.26 pints
X-77 Spreader-sticker.	18.5 ounces

c. Cost per 100 gallon mix:

Sevin and Kelthane	$ 12.00
Cygon and X-77	21.95

EXHIBIT "G"

EXPENDITURES FOR

1968 EUROPEAN PINE SHOOT MOTH EASTERN OREGON SPRAY PROJECT

A.	Oregon State Department of Forestry		
	1. Salaries and Expenses	$1,034.45	
	2. Transportation	470.00	
	3. Supplies	362.26	
	4. Indirect Costs	13.72	
	5. Contract	2,868.80	
	Total	$4,749.23	
B.	Oregon State Department of Agriculture		
	1. Salaries and Expenses	$ 827.52	
	2. Transportation	61.05	
	Total	$ 888.56	
	Grand Total		$5,637.79
C.	Source of Funds		
	1. State of Oregon		
	Appropriations	$2,818.90	
	2. U. S. Forest Service		
	Reimbursed to State	$2,518.89	
	Technical Assistance	300.00	
	Total	$2,818.89	
	Grand Total		$5,637.79

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